

REMARKS

After entry of this amendment, claims 1-20 are pending in this application. Claims 1, 2 and 9 have been amended to more particularly point out and distinctly claim the subject matter that the Applicant regards as the invention. Reconsideration of the application as amended is requested.

In the Office Action dated April 9, 2002, claims 1-2, 6 and 8 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Materne, et al., U.S. Patent No. 5,331,257. It is noted that the Examiner has also apparently rejected claims 5, 9-11, 16 and 19 as being anticipated by Materne, et al, in Section 2 of the Office Action. It is submitted that Materne, et al., does not teach or suggest the invention as recited in claim 1. In particular, Materne, et al., does not teach or suggest a stator equipped with sensors wherein the sensors lie in the same plane as the carbon brushes of the electrical machine as recited in the claim and in the application as originally filed on page 2, line 35 and page 4, lines 29-30. The sensors 20, 22 of Materne, et al., are spaced longitudinally from the carbon brushes shown generally by brush holders 44, 45 along the axis of the commutator 7. '257 patent, Figure 4. It is therefore submitted that claim 1 patentably defines over Materne, et al., and is in suitable condition for allowance. Claims 2, 5-6 and 8 depend from claim 1 and are therefore also in suitable condition for allowance. Claim 9 recites a sensor positionable in the same plane as the at least one carbon brush and is therefore also in suitable condition for allowance. Claims 10-11, 16 and 19 depend from claim 9 and are therefore also in suitable condition for allowance.

Claims 3-4, 6, 8, 12, 15, and 17-18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Materne, et al., in view of Knappe, U.S. Patent No. 5,565,721. The Examiner has also apparently rejected claims 5 and 13 as obvious over Materne, et al., in view of Knappe in Section 4 of the Office Action. It is submitted that neither Materne, et al., nor Knappe, taken singularly or in any permissible combination, teach or suggest the invention as recited in claim 1. As stated above, Materne, et al., does not teach or suggest a stator equipped with sensors wherein the sensors lie in the same plane as the carbon brushes. Knappe does not

overcome this deficiency. In particular, the Hall probes 9, 10 are spaced longitudinally from the brushes (unnumbered), see Figure 1. It is therefore submitted that claim 1 patentably defines over the references and is in suitable condition for allowance. Claims 3-6 and 8 depend from claim 1 and are therefore also in suitable condition for allowance. Claim 9 recites a sensor positionable in the same plane the carbon brush and is therefore also in suitable condition for allowance. Claims 12-13, 15 and 17-18 depend from claim 9 and are therefore also in suitable condition for allowance.

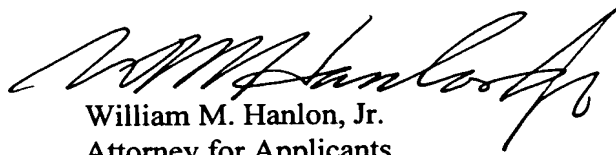
Claims 7 and 20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Materne, et al., in view of Kobman, et al., U.S. Patent No. 5,962,946. It is submitted that neither Materne, et al., nor Kobman, et al., taken singularly or in any permissible combination, teach or suggest the invention as recited in claim 1. As stated above, Materne, et al., does not teach or suggest a stator equipped with sensors wherein the sensors lie in the same plane as the carbon brushes. Kobman, et al., does not overcome this deficiency since Kobman, et al., does not teach or suggest a stator equipped with sensors. It is therefore submitted that claim 1 patentably defines over the references and is in suitable condition for allowance. Claim 7 depends from claim 1 and is therefore also in suitable condition for allowance. Claim 9 recites a sensor positionable in the same plane as the at least one carbon brush and therefore patentably defines over the references. Claim 20 depends from claim 9 and is therefore also in suitable condition for allowance.

It is respectfully submitted that this Amendment traverses and overcomes all of the Examiner's objections and rejections to the application as originally filed. It is further submitted that this Amendment has antecedent basis in the application as originally filed, including the specification, claims and drawings, and that this Amendment does not add any new subject matter to the application. It is respectfully submitted that this Amendment places the application in suitable condition for allowance; notice of which is requested.

If the Examiner feels that prosecution of the present application can be expedited by way of an Examiner's amendment, the Examiner is invited to contact the Applicant's attorney at the telephone number listed below.

Respectfully submitted,

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WOOD & HELMHOLDT, P.C.

A handwritten signature in cursive script, appearing to read 'W M Hanlon Jr', is written over the typed name.

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Date: July 9, 2002
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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the specification:

Replace the paragraph beginning on page 1, line 6, and ending on page 1, line 13 with:

The invention pertains to a device for measuring the angle of rotation or a value derived therefrom in an electrical machine equipped with a commutator. This machine can be a motor or a dynamo or generator. Essential for the invention is that a commutator is provided that is equipped in a known manner with electrically conductive contacts, via which currents are conducted in temporal sequence that produce a more or less constantly alternating field. Conversely, in the case of a dynamo, the commutator can receive the generated current. The invention can also be used with annular sliding contacts.

Replace the paragraphs beginning on page 3, line 29, and ending on page 4, line 15 with:

The segments 2 of the commutator 1 consist of an electrically conductive material penetrable by a magnetic field, copper in the present embodiment. The commutator 1 has a basic body 3 bearing the segments 2. The basic body 3 consists of an electrically insulating material that nevertheless permits magnetic flux to pass through the basic body 3 itself. In the case of the embodiments shown in Figures [1-3] 1 and 3, the basic body 3 is made of plastic.

The basic body 3 is sectionally magnetized. The sectional magnetization of the basic body 3 can be accomplished in various ways. In the case of the embodiments in Figures 1 and 2, an annular recess [5] is formed in the plastic basic body 3 of the commutator 1, into which an annular magnet 4 is fitted. In the embodiment in Figure 3, segmented recesses 5 are formed in the plastic basic body 3, into which prefabricated magnetic segments 6 are fitted. Finally, in the embodiment shown in Figure 4, the entire basic body 3 consists of a magnet made of electrically insulating and magnetizable material. The magnet of the basic body 3 is, for example, molded or sintered. During or following the molding process or sintering

process, the magnet is sectionally or completely magnetized. In the case of the embodiment depicted here, the magnetized sections 7 of the basic body 3 are identified.

Replace the paragraph beginning on page 4, line 26, and ending on page 4, line 34 with:

In addition to the rotary status of the motor, it is also possible, with the device for measuring the angle of rotation according to the invention, to determine the rotary speed, the rotary acceleration or another value of the rotor derived from the rotary status. The advantage of the invention lies particularly in the fact that the sensors 8, 9 can lie in the same plane as the carbon brushes 10 of the electrical machine, as shown in Figure 1. The constructive length of the electrical machine can be shortened thereby. Similarly, the sensors 8, 9 can be spatially separated farther from the interference suppressors located on the rear end shield of the motor. In this manner, the sensors 8, 9 are rendered less subject to interference from the suppressors.

In the claims:

1. (Twice Amended) A device for measuring the angle of rotation for an electrical machine equipped with a commutator, a stator and carbon brushes, in which segments of the commutator are formed of an electrically conductive material penetrable by a magnetic field of the commutator, characterized in that a basic body of the commutator bearing the segments is permanently magnetized, at least sectionally, and that the stator of the machine is equipped with sensors responding to the rotary status of the commutator, wherein the sensors lie in the same plane as the carbon brushes.

2. (Twice Amended) The device for measuring the angle of rotation according to Claim 1 [,] characterized in that [the] each sensor has at least one Hall element [,] which is penetrable by the magnetic field of the commutator.

9. A device for measuring the angle of rotation for an electrical machine with a shaft and at least one carbon brush, comprising:

a commutator including electrically conductive segments concentrically arranged around a basic body mounted on the shaft wherein the basic body includes at least one magnetized section; and

a sensor responding to a magnetic field generated upon rotation of the commutator, wherein the sensor is positionable in the same plane as the at least one carbon brush.